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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/782,723	02/18/2004	Jennifer Wang	P1572	3420

7590 01/18/2006

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EXAMINER	
CHEN, KIN CHAN	
ART UNIT	**PAPER NUMBER**
1765	

DATE MAILED: 01/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/782,723	WANG ET AL.	
	Examiner	Art Unit	
	Kin-Chan Chen	1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 December 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) *15-17* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14 and 18-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election of claims 1-14 and 18-20 with traverse on December 27, 2005 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-4, 7-14 and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chino et al. (US 5,968,845; hereinafter "Chino") or Miyakuni et al. (US 5,942,447;hereinafter "Miyakuni") as evidenced by Demmin (US 6,635,185).

In a method for etching a compound semiconductor material, Chino (abstract; col.11, 14; table 1 and 2) or Miyakuni (col. 7, 8) teaches that the compound semiconductor material (GaAs or InP, instant claim 7) may be placed in a chamber. A

halogen etchant (e.g., chlorine, instant claim 4) may be released into the chamber. Nitrogen may be added. The compound semiconductor may be heated. A pressure may be applied to the etchant. Chino (col. 15, lines 19-21) or Miyakuni (col. 15, lines 29-30) teaches inductively coupled plasma (ICP) may be used for the etching process, therefore, it is considered to read on applicant's "applying a bias power and a pulse-modulated power."

Chino or Miyakuni teaches an etching method for manufacturing a compound semiconductor device. The disclosure of Chino or Miyakuni is not limited to any particular device structure. Hence, it would have been obvious to one with ordinary skill in the art to etch via-hole, which is a well-known feature in the semiconductor device fabrication, the examiner takes official notice.

The above-cited claims differ from the prior art by specifying various processing parameters (such as etch rate in claims 2, 14, and 19; volumetric flow rates in claims 3, 8, and 20; temperature in claim 9, pressure in claim 10, bias power in claim 11, ICP power in claim 12; etching selectivity in claim 13). However, same were known to be result-effective variables and commonly determined by routine experiment. The process of conducting routine experimentations so as to produce an expected result is obvious to one of ordinary skill in the art. In the absence of showing criticality or new, unexpected results, a person having ordinary skill in the art would have found it obvious to modify the prior art by performing routine experiments (by using different process parameters) to obtain optimal result with a reasonable expectation of success. See col. 8, lines 31-48 of Miyakuni, and Demmin (col. 7, lines 5-25) as evidence.

4. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chino or Miyakuni as applied to claims 1 and 3 above, and further in view of Hayasaka et al. (US 6,649,082; hereinafter "Hayasaka").

The discussion of modified Chino or Miyakuni from above is repeated here.

Chino (abstract) or Miyakuni (col. 4, line 2) discloses that halogen-containing gas may be used for etching. It is well known in the art of semiconductor device fabrication that halogen-containing gas includes chlorine, bromine, hydrogen bromide or hydrogen iodide. Hauasaka is only relied on to show this well-known feature. Because it is well known in the art and because it is disclosed by Hauasaka, hence, it would have been obvious to one with ordinary skill in the art to use hydrogen bromide in the process of Chino or Miyakuni in order to perform the etching effectively.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Demmin (US 6,635,185; col. 7, lines 5-25) discloses that one skilled in the art of plasma etching and cleaning may vary composition, flow rate, temperature, pressure, power, time, bias, accordingly to etch a desired material satisfactorily.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kin-Chan Chen whose telephone number is (571) 272-

1461. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

January 12, 2006

Kin-Chan Chen
Primary Examiner
Art Unit 1765

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